

### REMARKS

This Preliminary Amendment cancels, without prejudice, claims 1 to 10 in the underlying PCT Application No. PCT/EP2004/008186 and adds new claims 11 to 24. The new claims, inter alia, conform the claims to United States Patent and Trademark Office rules and does not add any new matter to the application.

In accordance with 37 C.F.R. § 1.125(b), the Substitute Specification (including the Abstract) contains no new matter. The amendments reflected in the Substitute Specification (including Abstract) are to conform the Specification and Abstract to United States Patent and Trademark Office rules or to correct informalities. As required by 37 C.F.R. §§ 1.121(b)(3)(ii) and 1.125(c), a Marked-Up Version of the Substitute Specification comparing the Specification of record and the Substitute Specification also accompanies this Preliminary Amendment. Approval and entry of the Substitute Specification (including Abstract) are respectfully requested.

The underlying PCT Application No. PCT/EP2004/008186 includes an International Search Report, dated November 30, 2004, a copy of which is included. The Search Report includes a list of documents that were considered by the Examiner in the underlying PCT application.

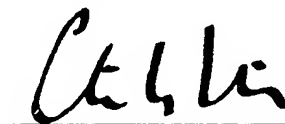
The underlying PCT Application No. PCT/EP2004/008186 also includes an International Preliminary Examination Report, dated July 1, 2005, a copy of which is included.

It is respectfully submitted that the subject matter of the present application is new, non-obvious and useful. Prompt consideration and allowance of the application are respectfully requested.

Respectfully submitted,

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## SUPPORTING FRAME FOR A UTILITY VEHICLE

**FIELD OF THE INVENTION**

The **present** invention relates to a supporting frame for a utility vehicle, ~~in particular~~ **e.g.**, a tractor unit, having a front part, a center part and a rear part.

5

**BACKGROUND INFORMATION**

German ~~Laid-Open-Specification~~ DE **Published Patent Application**

**No.** 43 22 716 A1 ~~discloses~~ **describes** a supporting frame for utility vehicles which is composed of three different

10 sections, namely, a front part for fitting the front axle region, a center part, and a rear part for fitting the rear axle. The front part and the rear part are each composed of longitudinal member segments connected to cross members, the longitudinal member segments being designed as aluminum

15 castings with numerous ribs. The center part has a box-shaped cross section, the two side walls of the center part assuming a supporting function and being composed of extruded aluminum profiles. Provision is made for the three different sections to be preassembled as modules, and for all the components

20 which are to be fastened to the supporting frame to be arranged on the corresponding sectional frame before the sectional frame is connected. The longitudinal member segments in the front part and rear part have an H section.

25 German **Published** Patent **Application No.** [[DE]] 101 48 312 C1 ~~discloses~~ **describes** a supporting frame for a chassis of a utility vehicle, this supporting frame having a box-shaped ~~cross-section~~ **cross-section** over its entire length. The supporting frame is composed of two top chords, two bottom

30 chords and thrust plates connecting ~~said~~ **the** chords to one another. The bottom chords may be of three-piece design, so that each bottom chord has a front piece, a center piece and a rear piece. The drive train and if need be further components

may be installed in the interior space of the box-shaped supporting frame.

A further supporting frame for utility vehicles with a box-shaped ~~cross-section~~ cross-section over its entire length ~~has been disclosed by~~ is described in German Laid Open Specification DE Published Patent Application No. 197 50 981 [[A1]].

A supporting frame for a utility vehicle ~~has been disclosed by~~ is described in German Laid Open Specification DE Published Patent Application No. 101 37 379 [[A1]], this supporting frame having a box-shaped ~~cross-section~~ cross-section and being composed of in each case two top chords and two bottom chords and vertical webs connecting the top chords and bottom chords to one another. The two top chords and the two bottom chords are likewise connected by ~~means of~~ webs. The webs are arranged [[in]] such a ~~way~~ that a reinforcing frame closed all round is obtained.

#### SUMMARY

~~The invention is intended to~~ An example embodiment of the present invention may provide a supporting frame for utility vehicles which, compared with conventional supporting frames, ~~provides~~ may provide more space for accommodating functional elements, for example, exhaust gas cleaning systems and fuel tanks.

To this end, according to an example embodiment of the present invention, a supporting frame for a utility vehicle, ~~in particular~~ e.g., a tractor unit, having a front part, a center part and a rear part, [[is]] may be provided in which the center part is of latticework-like construction with at least two top chords and two bottom chords and forms a box-shaped ~~cross-section~~ cross-section as viewed in the longitudinal

direction of the vehicle, and in which the front part and the rear part are of ladder-frame-like ~~design~~ arrangement with a right-hand and a left-hand longitudinal member, the longitudinal members having a U-like ~~cross-section~~ cross-  
5 section as viewed in the longitudinal direction of the vehicle.

Compared with conventional supporting frames, the latticework-like ~~design~~ arrangement of the center part of box-shaped ~~cross-~~  
10 ~~section results~~ cross-section may result in more space for accommodating, for example, exhaust gas cleaning systems and fuel tanks. As a result, due to the supporting frame ~~according to the invention~~ hereof, future exhaust gas regulations for utility vehicles ~~can~~ may be fulfilled without  
15 reducing the fuel tank volume. On the other hand, the front part and the rear part ~~[[are]]~~ may be constructed in a proven manner with longitudinal members of U-like ~~cross-section~~ cross-section, so that proven engine, rear-axle and front-axle fastenings ~~can~~ may be used.

20 ~~In a development of the invention, in~~ In the front and rear part, the legs of the longitudinal members of U-like ~~cross-section~~ cross-section in each case may extend in the direction of the opposite longitudinal members, and the top chords  
25 and/or bottom chords lying at the longitudinal edges of the center part may have an L-like ~~cross-section~~ cross-section as viewed in the longitudinal direction of the vehicle.

~~By virtue of the fact that~~ Since the top chords and/or bottom  
30 chords in the center part have an L-like ~~cross-section~~ cross-section, as much space as possible ~~[[is]]~~ may be provided inside the box-shaped ~~cross-section~~ cross-section of the center part for the installation of functional elements.

~~In a development of the invention, a~~ A first leg of the top chords and/or bottom chords of L-like ~~cross-section runs~~ cross-section may extend parallel to a base of the respectively associated longitudinal member of the front part and/or rear part, and a second leg of the top chords and/or bottom chords ~~extends outward~~ may extend outwardly from the base of the respectively associated longitudinal member in the opposite direction to the legs of the longitudinal members.

Due to such an arrangement, the space inside the box-shaped ~~cross-section~~ cross-section of the center part ~~can~~ may be utilized more effectively. Nonetheless, a robust supporting frame ~~[[is]]~~ may be ensured.

~~In a development of the invention, an essentially~~ A substantially triangular thrust plate for connecting the top chord, the bottom chord and the respectively associated longitudinal member of one side ~~[[is]]~~ may be provided.

For example, a triangular thrust plate having a central aperture may be selected, so that a robust connection of top chord, bottom chord and longitudinal member ~~[[is]]~~ may be possible on the one hand and material and weight ~~[[are]]~~ may be saved on the other hand.

~~In a development of the invention, the~~ The top chords and bottom chords of one side, the two opposite top chords and/or the two opposite bottom chords ~~are~~ may in each case be connected to one another by ~~means of~~ thrust plates.

The selection of thrust plates ~~enables~~ may provide as large a useful space as possible to be provided inside the center part of box-shaped ~~cross-section~~ cross-section. For example, thrust plates of a lightweight type of construction may be

selected in order to keep down the overall weight of the supporting frame.

~~In a development of the invention, the~~ The bottom chords, at least in the region of the rear end of the center part, are may be connected to one another by ~~means of~~ a portal member which is U-like as viewed in the longitudinal direction of the vehicle and is open downward.

10 By ~~means of~~ such a portal member, a robust connection of the two bottom chords ~~[[is]]~~ may be provided on the one hand and the space for the spring deflection and rebound movements of a cardan shaft ~~[[is]]~~ may be provided on the other hand.

15 ~~In a development of the invention, the~~ The portal member, in its top region opposite the bottom chords, ~~[[is]]~~ may be connected to a cross member of the front part or rear part.

In this way manner, a connection to the front part or rear part ~~[[is]]~~ may be achieved which ~~[[is]]~~ may be simple in terms of design and ~~[[is]]~~ may at the same time be robust.

~~In a development of the invention, a~~ A chassis fastening for the rear axle, ~~in particular e.g.,~~ a stabilizer mount, ~~[[is]]~~ may be arranged in the region of the rear end of the bottom chords of the center part.

The arrangement of a chassis fastening in the region of the rear end of the bottom chords of the center part ~~has the~~ advantage may provide that the rear end of the bottom chords is located essentially at axle level. Compared with conventional supporting frames, in which complicated struts have to be provided in order to provide an articulation point at axle level, construction cost and weight ~~can~~ may therefore be saved. Specifically in the case of a stabilizer mount in

which, according to an example embodiment of the present  
invention, 'only one mounting stirrup ~~has~~ may have to be  
fastened to the rear end of the bottom chords, a considerable  
weight saving ~~[[is]]~~ may be obtained compared with a  
5 conventional ~~design~~ arrangement in which a robust member ~~has~~  
may have to extend from the longitudinal member down to  
approximately axle level.

Further features and ~~advantages of the invention follow from~~  
10 ~~the claims and the description~~ aspects of example embodiments  
of the present invention are described in more detail below ~~of~~  
~~a preferred embodiment of the invention in connection with~~  
reference to the drawings, in which: appended Figures.

#### 15 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 ~~shows~~ is a perspective exploded illustration view of  
~~[[the]]~~ a supporting frame according to an example embodiment  
of the present invention~~[[,]]~~.

20 Fig. 2 ~~shows~~ illustrates the supporting frame ~~[[of]]~~  
illustrated in Fig. 1 in ~~[[the]]~~ an assembled state, ~~and~~.

Fig. 3 ~~shows the~~ illustrates a supporting frame according to  
an example embodiment of the present invention and provided  
25 with functional elements, in an exploded illustration view.

#### DETAILED DESCRIPTION

The supporting frame 10 ~~according to the invention and shown~~  
illustrated in Fig. 1, for a utility vehicle, ~~is intended in~~  
30 ~~particular~~ may be used, for example, for a tractor unit. As  
viewed in a forward travel direction 12, the supporting frame  
10 has a front part 14, a center part 16 and a rear part 18.

The front part 14 ~~[[is]]~~ may be constructed in a conventional  
35 manner ~~per se~~ and, as viewed in the forward travel direction

12, has a right-hand longitudinal member segment 20, a left-hand longitudinal member segment 22 and a cross member 24 connecting the two longitudinal member sections 20, 22. The two longitudinal member segments 20, 22 are each designed  
5 arranged in the shape of a U profile with a base and two legs starting from the base and extending in the same direction. ~~In this case, the~~ The U-profile-shaped longitudinal member segments 20, 22 are arranged ~~[[in]]~~ such a way that the legs of the longitudinal member segments 20, 22, starting from the  
10 base, each extend in the direction of the opposite longitudinal member segment 20, 22.

The rear part 18 ~~is likewise composed~~ may be arranged in a conventional manner ~~per se~~ of a right-hand longitudinal member  
15 segment 26, as viewed in the forward travel direction 12, a left-hand longitudinal member segment 28 and two cross members 30, 32. Like the front part 14, this also gives the rear part 18 a ladder-frame-like construction. The longitudinal member segments 26, 28 of the rear part 18 are ~~likewise designed~~  
20 arranged in the shape of a U profile and are oriented relative to one another in the same way manner as the longitudinal members segments 20, 22 of the front part 14.

As viewed in the forward travel direction 12, the center part  
25 16 has a right-hand top chord 34, a left-hand top chord 36, a right-hand bottom chord 38 and a left-hand bottom chord 40. The top chords 34, 36 and the bottom chords 38, 40 each have an L-shaped ~~cross-section~~ cross-section as viewed in the longitudinal direction of the vehicle and are each bent  
30 transversely to the longitudinal direction of the vehicle in order to be able to be adapted to the different frame widths of the front part 14 and of the rear part 18.

In their center region, the two top chords 34, 36 are  
35 connected to one another by ~~means of~~ a thrust plate 42 in a lightweight type of construction. In the same way manner, the

right-hand top chord 34 and the right-hand bottom chord 38 are connected to one another by ~~means of~~ a further thrust plate 44 in a lightweight type of construction, and the left-hand top chord 36 and the left-hand bottom chord 40 are connected to  
5 one another by ~~means of~~ a further thrust plate 46 in a lightweight type of construction. The thrust plates 42, 44 and 46 result in reinforcement in the center region of the center part 16, this reinforcement ~~running~~ extending around three sides of the box-shaped center part 16. However, the  
10 center part 16 remains open toward the underside. As a result, for example, sufficient space ~~[[is]]~~ may be available for the spring deflection and rebound movements of a cardan shaft.

15 In the front region of the center part 16, the right-hand bottom chord 38 and the left-hand bottom chord 40 are connected to one another by ~~means of~~ a cross member 48. At the level of the cross member 48, the right-hand bottom chord 38 and the right-hand top chord 34 are connected to one  
20 another by ~~means of~~ a rear leg of a triangular thrust plate 50, and in the same way manner, on the opposite side of the center part 16, the left-hand top chord 36 and the left-hand bottom chord 40 are connected by ~~means of~~ a leg of a further triangular thrust plate 52. ~~In this case, the~~ The triangular  
25 thrust plates 50 are arranged at the front end of the center part 16 ~~[[in]]~~ such a way that a further leg in each case ~~runs~~ extends parallel to the right-hand top chord 34 and the left-hand top chord 36, respectively, and constitutes their extension beyond their respective front end. The two legs of  
30 the triangular thrust plates 50, 52 are ~~in this case~~ arranged at a right angle to one another, and a connecting strut of the triangular thrust plates 50, 52 ~~runs~~ extends at an angle of about 45° to the two legs and connects their ends. The construction of the triangular thrust plates 50, 52 with two  
35 legs and a connecting strut is produced ~~in this case~~ by the provision of a triangular central aperture in the thrust plate

50, 52. The center part 16 is connected to the front part 14 by the two top chords 34 and the top legs of the triangular thrust plates 50, 52 being overlapped with and connected to the base of the respectively associated longitudinal member segments 20, 22.

At the rear end of the center part 16, the right-hand top chord 34 and the right-hand bottom chord 38 are connected to one another by ~~means of~~ a triangular thrust plate 54 which is of identical construction to the thrust plates 50, 52 already explained. The left-hand top chord 36 and the left-hand bottom chord 40 are also connected to one another in the region of the rear end of the center part 16 by ~~means of~~ a further triangular thrust plate 56 which is likewise of identical construction to the thrust plates 50, 52 already explained.

The arrangement of the rear triangular thrust plates 54, 56 is ~~in this case~~ selected to be the same as the arrangement of the front thrust plates 50, 52, so that, at the two rear thrust plates 54, 56, the connecting strut arranged at an angle to the top chords 34, 36 and the bottom chords 38, 40 also faces the front in each case with respect to the forward travel direction 12.

In addition, in the region of the rear end of the center part 16, the two bottom chords 38, 40 are connected to one another by ~~means of~~ a U-shaped portal member 58. The provision of the portal member 58 firstly creates a robust connection of the rear ends of the bottom chords 38, 40 and at the same time provides sufficient space for the spring deflection and rebound movements of the cardan shaft. ~~As can be seen from~~ illustrated in Fig. 2, the top section of the portal member 58 is connected to the cross member 30 of the rear part 18 in the assembled state.

In addition, in the region of the rear ends of the bottom chords 38, 40, in each case a stabilizer mount 60 is provided on the outer side of the bottom chords 38, 40. The stabilizer mounts 60 are each of stirrup-shaped ~~design~~ arrangement, the intention being for a respective stabilizer link for the rear axle to be accommodated in the stirrup.

~~As can be seen from Figs~~ illustrated in Figs. 1 and 2, the individual components of the supporting frame are riveted or screwed to one another. To this end, numerous through-holes are provided in the individual components.

~~From Fig. 2, which shows~~ is a perspective view of the assembled supporting frame 10 ~~[[of]]~~ illustrated in Fig. 1, it ~~can be seen~~ is illustrated that the right-hand top chord 34 and the right-hand longitudinal member segment 20 of the front part 14 overlap one another and are fastened to one another in the region of this overlapping. Together with the connection of the triangular thrust plate 50 to the right-hand top chord 34, the right-hand longitudinal member segment 20 and the front end of the right-hand bottom chord 38, an extremely robust connection of the center part 16 to the front part 14 ~~[[is]]~~ may be obtained. The opposite connection of the left-hand top chord 36 to the left-hand longitudinal member segment 22 of the front part 14 ~~is executed~~ may be provided in an analogous manner.

In the region of the connection between the center part 16 and the rear part 18, the right-hand top chord 34 and the right-hand longitudinal member segment 26 of the rear part 18 overlap one another and are fastened, for example, riveted ~~[[or]]~~ screwed, etc., to one another in the region of this overlapping. The top leg of the triangular thrust plate 54 essentially completely covers the region of the overlapping between the right-hand top chord 34 and the right-hand longitudinal member segment 26 and is connected, for example,

riveted ~~[[or]]~~, screwed, etc., to the top chord 34 and the right-hand longitudinal member segment 26 of the rear part 18 in the region of the overlapping. Together with the connection of triangular thrust plate 54 to the rear end of the right-hand bottom chord 38, an extremely robust connection of the center part 16 to the rear part 18 ~~[[is]]~~ may be obtained as a result. On the opposite side, the left-hand top chord 36, the left-hand longitudinal member segment 28 of the rear part 18 and the rear end of the left-hand bottom chord 40 are connected to one another in the same way manner by means of the triangular thrust plate 56.

The schematic, perspective view of Fig. 3 ~~again shows~~ illustrates the supporting frame 10 according to an example embodiment of the present invention in an exploded illustration, some functional elements already being installed in the front part 14 and the rear part 18. As becomes clear from the illustration in Fig. 3, the front part 14, the center part 16 and the rear part 18 ~~can~~ may thereby be preassembled as modules and ~~can~~ may then be put together in the preassembled state to form the supporting frame 10. As a result, the production times ~~can~~ may be markedly reduced and the accessibility during the fitting of the individual functional elements ~~[[is]]~~ may be improved.

Specifically, according to the illustration in Fig. 3, a drive unit 62 with transmission 64 is installed in the front part 14. Furthermore, a front axle, for example, ~~could~~ may be attached to the front part 14, and only then would the latter, with attached front axle, be put together with the center part 16 and the rear part 18.

In the illustration in Fig. 3, a rear axle 66 is already attached to the rear part 18. Two stabilizer links 68 ~~can~~ may readily be seen, which on the one hand are connected to the rear axle 66 and on the other hand are inserted into the

stabilizer mount 60. The stabilizer links 68 ~~run~~ extend essentially at the level of the center of the rear axle 66, and consequently the stabilizer mounts 60 are also arranged approximately at the level of the center of the rear axle 66.

5 As ~~can be seen~~ illustrated in ~~Figs~~ Figs. 1 to 3, the stabilizer mounts 60 are ~~designed~~ may be arranged as compact stirrup-shaped mounting points. Compared with [[the]] conventional ~~design~~ arrangements of such stabilizer mounts, this ~~permits~~ may provide a considerable saving of material and  
10 weight, since, in conventional supporting frames, the mounting points likewise have to be arranged approximately at the level of the center of the rear axle 66, and consequently the stabilizer mount requires a member which extends from the right-hand or left-hand longitudinal member beyond the level  
15 of the center of the rear axle.

On the whole, Example embodiments of the present invention provides may provide a supporting frame for a utility vehicle which, compared with conventional supporting frames, ~~provides~~  
20 may provide more space in the region of the center part 16 for accommodating an exhaust gas cleaning system and a fuel tank. Nonetheless, proven unit fastenings ~~can~~ may be used in the region of the front part 14 and the rear part 18, since, in the region of the front part 14 and the rear part 18, the  
25 supporting frame 10 ~~according to the invention is~~ hereof may be adapted in the ladder-frame-like type of construction ~~per se~~, with right-hand longitudinal member segments 20, 26, left-hand longitudinal member segments 22, 28 and cross members 24, 30, 32 connecting ~~said~~ the longitudinal member segments.

Abstract

**ABSTRACT**

~~1. Supporting frame for a utility vehicle.~~

5    ~~2.1 The invention relates to a~~ **A** supporting frame **is** for a utility vehicle, ~~in particular~~ **e.g.**, a tractor unit, having a front part, a center part and a rear part.

10    ~~2.2 According to the invention, the~~ **The** center part is of latticework-like construction with at least two top chords and at least two bottom chords and forms a box-shaped ~~cross-section~~ **cross-section** as viewed in the longitudinal direction of the vehicle, and the front part and the rear part are of ladder-frame-like ~~design~~ **construction** with a right-hand and a  
15    left-hand longitudinal member segment, the longitudinal member segments having a U-like ~~cross-section~~ **cross-section** as viewed in the longitudinal direction of the vehicle.

20    ~~2.3 Use~~ **The foregoing may be used**, for example, for tractor units having a voluminous exhaust gas cleaning system and a large fuel tank.